



# Namibian mining industry – role and prospects

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**Namibia is highly dependent on a narrow, mining-dominated export base. When the country became independent in 1990 it was faced with the difficult task of turning the economy toward a positive growth. This article analysis the link between an unstable international commodity market and the Namibian economy.**

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Many developing countries have concentrated on the production and export of primary products as their means of raising revenue and achieving economic growth. However, countries that concentrate on a few primary products and that have limited number of trading partners are vulnerable, in that, they are dependent on the export earnings of these few products. The greater the degree of price instabilities on the international commodity markets, the more difficult it is for these nations to maintain steady employment because of shocks to real income, government revenue, capital formation, resource allocation and the capacity to import.

Over the years, Namibia's economy has largely relied on a narrow, mining-dominated export base. The absence of a balanced development strategy for the mining industry before independence, which could have promoted the integration of mining with other sectors of the economy, has been detrimental to the establishment of a more diversified economy. Due to fluctuations on the world market for Namibia's minerals during the past decade, the mining sector's contribution to GDP and export earnings have declined. The role of the mining sector has also deteriorated in other senses as employment in mining companies and government revenue from the sector have declined. Investment in the mining sector has been insufficient, as a result of political and economic uncertainties in Namibia. This have hampered the economic development of the country. Namibia became political independent in 1990, and the government was faced with the difficult task of turning the economy toward positive growth.

By analysing the developments on the world market for Namibia's major minerals as well as the impact of changes in the Rand exchange rate on export earnings, over the last decade, we will below illustrate the link between unstable international commodity markets and the development of Namibia's mining industry. The integration of the mining sector to the rest

of the economy through various linkages, will also be investigated.

## **Namibian Mining Industry, 1850-1980**

During the nineteenth century, foreign traders were attracted by Namibia's rich natural resources. Discoveries of diamonds and gold brought Europeans in search of mining rights. In the middle of the nineteenth century, two small mines west of Windhoek opened. One of them was the Matchless copper mine, where modern exploitation dates to 1855. When Germany was appointed Namibia during the Berlin Conference in 1884, mining disposals were past from small prospectors to larger German, British and South African syndicates. Production of copper started in Tsumeb in 1901. Namibia's first railway was built to transport this ore to the port of Swakopmund. In 1908, the discovery of diamonds gave further impetus to industrialisation as mining towns like Kolmanskuppe, Elisabeth Bay, Pomona and Bogenfels were established in the Namib desert (Chamber of Mines, 1991, p 4).

During the 1920s, mining dominated the country's production. Some small scale mines were opened to extract tin and vanadium. During the first half of the twentieth century big profits were gained by the company owners. However, this did not help the country in general. Most mining employment was imported. Taxes were collected to finance railroads. However, they mostly benefited white farmers, and they helped to reinforce South African political control over Namibia. In the 1940s, the outlook on the world market degenerated, which resulted in a decline in Namibian mining. Production was cut back at Consolidated Diamond Mines (CDM), and the Tsumeb Mine closed between 1932-37. It was the strategy of CDM to decrease production in order to keep diamond prices up. Even though the companies made losses, they still hung onto their mines, expecting better times to come. After World War II, minerals were again in demand on world

*Cities and major mining communities in Namibia.*

**Namibia's major mines, key facts**

Company	Major shareholders	Type of product	Date established
Consolidated Diamond Mines (CDM)	DeBeers Consolidated Mines	diamonds	1928
Kombat Mine	Tsumeb Corporation	copper, lead, silver	1908
Navachab Gold Mine	AAC, CDM Metal Mining	gold	1989
Otjase Mine	Tsumeb Corp., Otjase Mining Co.	copper, silver, gold, pyrite	1975
Peralin	Private	marble	1962
Posh Pinah Mine	Isacor, Moly Copper	zinc, lead, silver	1968
Rössing Uranium Mine	RTZ	uranium oxide	1976
Salt Company	Private	salt	1936
SWA Lithium Mines	Utec	lithium	1950
Tsumeb Mine	Gold Fields Namibia, Gold Fields SA	copper, lead, silver, cadmium, arsenic	1900
Uis Tin Mine	Isacor	tin	1924 <sup>1</sup>

Source: Chamber of Mines of Namibia information handout.

Note: 1. Closed in 1991.



**Table 1**  
**Namibia's gross domestic product at factor cost 1980 - 1991**  
**MZAR, constant 1985 prices**

Sector	1980	1982	1984	1986	1988	1989	1990	1991
Mining and quarrying	1 215	1 002	957	908	953	876	828	870
Total primary	1 537	1 312	1 179	1 148	1 254	1 184	1 205	1 325
Secondary sector	260	278	253	254	279	263	298	302
Tertiary sector <sup>1</sup>	969	1 139	1 186	1 232	1 295	1 339	1 370	1 393
Total	2 766	2 729	2 618	2 634	2 828	2 786	2 873	3 020
Primary, per cent of total	56	48	45	44	44	42	42	44

Source: Economic Review, 1992  
 Note: Includes general government

markets. A major expansion programme began, and diamond stockpiled by CDM were sold. As the demand increased considerably, this generated huge profits.

During the 1960s, Tsumeb and CDM made large investments to improve production methods. Technology advanced and inputs of capital increased. Mechanised extraction and processing allowed production to rise and production costs to fall. Diamond production, which had fallen from around 600 000 carats per year in the late 1920s to 150 000 in the late forties, rose to over 1.5 m carats in the late 1960s. One main innovation at Tsumeb, which had complex ores, was further processing

of ores before export. Copper was melted and lead refined higher by-products which permitted extraction, such as silver.

During the 1970s, Namibia experienced a mineral boom. Mineral sales were 120 million Rand (MZAR) in 1970. Half of this came from diamonds, a quarter from copper, and the rest from lead, zinc, tin, vanadium, salt, arsenic, pyrites and cadmium. Mineral sales increased six-fold during the following decade. This resulted from a rapid rise in diamond prices and the opening of the Rössing Uranium Mine, the largest low grade open cast uranium mining operation in the world. Also, a number of smaller mines sprung up, financed by

transnational companies from France, West Germany as well as Britain, the United States, Canada and South Africa. By the late 1970s minerals accounted for almost half of the value of everything produced in the country, or more than four times greater than all agricultural production. Of the total goods exported, minerals constituted approximately 85 per cent (Catholic Institute for International Relations, 1985, p 29ff).

#### **The declining decade, 1980-1991**

From the 1970s, a picture emerges of a prosperous mining sector, vital to Namibia's income and stability, but owned by

**Table 2**  
**Rand/dollar exchange rate, dollar gold price and Namibia's mineral export (MZAR).**

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
ZAR/USD	0.87	0.88	1.09	1.11	1.47	2.22	2.27	2.04	2.33	2.63	2.62	2.79
Gold USD/Troy oz	613	460	380	424	360	317	368	447	437	381	384	-
Diamonds	520	271	258	281	280	498	757	535	812	1 028	847	1 217
Uranium	283	288	379	301	417	585	762	603	454	695	440	381
Other	179	138	158	179	202	291	268	272	447	518	503	418
Total mining	982	697	795	761	899	1 371	1 787	1 410	1 713	2 241	1 790	2 016

Source: Ministry of Mines and Energy, Namibia 1993.

*Woman mining tin close to Vis  
in central Namibia.*

transnational corporations and exposed to world market fluctuations.<sup>1</sup> During the 1980s this picture was dramatically rocked. The cause was a sharp slump in the world market. As shown in table 1 mining's relative contribution to GDP decreased, from 44 per cent in 1980 to 29 per cent in 1991. The same trends are visible for the mineral exports, which during the same period fluctuated between 79 per cent of total exports in 1980 and 61 per cent in 1991. Mining's contribution to tax revenue has also deteriorated, declining from 54.1 per cent in 1980 to only 12 per cent in 1991.

Employment in the mining sector declined from about 19 800 in 1980 to 12 232 in 1991, equivalent to six per cent of the labour force (World Bank, 1992, p 31).

The decline in mining's role in the Namibian economy can partly be explained by the fact that the mining sector has experienced a sharp decline in its contribution to gross domestic fixed investments. At 1985 prices, investment dropped from 211.4 MZAR in 1980 to 93 MZAR in 1989. During 1982-1986, investment in the sector was only between 30 and 70 MZAR a year. The drop in investment activity, especially from foreign sources, resulted principally from depressed mineral prices and the uncertain political and economic situation in Namibia. The reason for the upswing in 1988-89 was an improvement

in the prices for minerals and metals (World Bank, 1992, p 31). After the Rössing Uranium mine was commissioned in 1976, only two major mines have been opened in Namibia, the Okorusu fluorspar mine and the Navachab gold mine in the early and late 1989 respectively. Since the end of the 1980s CDM has undertaken major extensions at three locations, the Auchas mine, which was opened in 1989, a screening plant recommissioned at Chameis in 1990 and the Elisabeth Bay operation re-established in 1991 (Ericsson, 1992, p 25).

Detailed data on mining investments is not always available because many major mining companies do not publish their financial reports. However, investment figures for the total economy are available. They reveal that of total investments made between 1980 and 1991, an average of 25 per cent has been spent on machinery (Economic Review, 1992). Since the mining sector is the most important industry in Namibia much of these should have accrued to mining. We also know through interviews with the mining companies that most of them have spent money to update their equipment in order to remain competitive on the international market. Both CDM and Rössing presently uses highly technical production methods. However, most of

the equipment used at TCL dates back to the 1960s and is relatively labour intensive.

**Namibia's major minerals  
and mining companies**

Namibia's major minerals are diamonds, uranium and base-metals such as copper, lead and zinc. These are mined by Consolidated Diamond Mines, Rössing Uranium Limited and Tsumeb Corporation Limited, which together accounts for 95 per cent of the value of mineral production and export. See box Namibia's major mines which states Namibia's major mining companies as well as how most of the companies are interwoven through share holdings in each others' operations.

**The impact of the exchange rate  
on minerals export value**

The value of mineral sales in Namibia is affected by changes in the South African Rand exchange rate. Since Namibia still uses the South African Rand as domestic currency and is a member of the Common Monetary Area, Namibia is obliged to follow South Africa's exchange policy. The South African economy is dominated by its gold industry. In times when the US dollar gold price has declined, South Africa has weakened the exchange rate of the Rand against the dollar to support its gold pro-



duction. The value of the Rand has declined gradually throughout the 1980s as the dollar gold price has deteriorated. A strong depreciation of the Rand was notable in 1985 when its value decreased by 50 per cent against the dollar. As an effect Namibian mineral sales improved in 1985 and 1986. The following year the gold price rose, consequently the Rand appreciated against the dollar which in turn reduced the value of Namibian mineral exports. Since then the Rand/US dollar exchange rate and the US dollar gold price have deteriorated further. This resulted in an improvement in metal sales until 1991. See Table 2.

### Diamonds

Almost all the diamonds in Namibia are produced by Consolidated Diamond Mines (CDM). This is a wholly-owned subsidiary of DeBeers Centenary, while offshore mining is conducted under contract to CDM by DeBeers Marine, a subsidiary of DeBeers Consolidated Mines<sup>2</sup> (Commonwealth

Secretariat, 1993, p 2). CDM exercises total control over the Namibian diamond industry. It accounts for 90 per cent of the diamond production in Namibia.

Namibia's diamonds remain highly sought after by the world jewellery industry as output normally averages 98 per cent gem stones, with a high proportion of large diamonds. This makes Namibia important for the world diamond market. CDM sells its diamonds through DeBeer's London-based marketing arm, the Central Selling Organisation (CSO), which allocates sales and sells 80 per cent of the world's uncut diamonds.

This diamond marketing monopoly should allow DeBeers to regulate carefully the world gem supply and price. In order to keep the diamond prices up, activities at CDM have been used to control the flow of diamonds on the world market. Production increased when demand has been high and, conversely, when the diamond market has been weak, mining has been cut back (Mbuende, 1986, p 116f).

The development of the Namibian diamond industry relies to a large extent on the policy undertaken by DeBeers, which in turn is governed by the diamond world market conditions. Total supply of diamonds almost doubled in terms of produced carats during the 1980s. Demand has over the same period grown satisfactorily, resulting in a steady increase in the world market price for diamonds, apart from the beginning of the 1980s when DeBeers did not succeed in stabilising the prices. Since 1989, DeBeers has not managed to control the diamond market successfully and the price has therefore stagnated. During the last four years the recession in the major economies have caused world demand to fall. At the same time the market situation has been aggravated by the dramatic outflow of illicit diamonds from Angola and Russia into the world market, representing a 10 per cent addition to world supply (Financial Times, 11 January, 1993). Faced with this problem, DeBeers has spent billions of US dollars buying up this surplus on the open market. Weak demand and growing supply have caused the outlook for diamond prices to look gloomy. In September 1992, DeBeers reduced its contract deliveries from all producers, including CDM, by 25 per cent to improve its market power (Interview with Sej Moteu, DeBeers Johannesburg, 23 March, 1993).

The 1980s can be regarded as a deteriorating decade for the Namibian diamond industry. See table 3. From 1.56 M carats produced in 1980, output declined throughout the 1980s. The main reason for this is that the average ore grade of carats has declined from about 10 carats per 100 tons treated ore in 1981 to 4.4 in 1990. As a combined result of the lower output recovered and the declining diamond prices in the beginning of the 1980s diamond's contribution to Namibian export earnings dropped over the last decade. With rising diamond prices during the latter part of the 1980s, the importance of diamonds in terms of export earnings have increased, contributing about 35 per cent to total merchandise exports in 1992.<sup>3</sup> DeBeers' decision to cut back its purchase of diamonds

**Table 3**  
**Diamonds: Production and share of Namibia's export**

Year	Output (carats)	Share of of exports per cent	Ore treated (Mt)	Average ore grade (carats/100 t)
1980	1 559 885	41.7	16.82	9.3
1981	1 250 629	26.5	12.54	10.0
1982	1 017 477	23.5	10.02	10.1
1983	968 414	26.7	8.59	10.0
1984	932 863	23.4	7.55	12.3
1985	910 494	28.6	8.13	11.1
1986	1 011 168	34.0	12.14	8.3
1987	1 030 092	26.0	13.44	7.6
1988	974 565	33.6	16.01	5.8
1989	931 735	35.0	16.83	5.2
1990	761 266	30.6	16.39	4.4
1991	1 186 870	37.3	-	-
1992	1 547 966	35.0	-	-

Sources: The Economist Intelligence Unit 1992, Economic Review 1992.

by 25 per cent have unfortunately occurred at time when CDM's operations were making good progress. In 1992 total production at CDM rose to a record of 1547 966 carats, mainly as a result of higher production levels due to large investments in new mines undertaken in 1990 and 1991. CDM might therefore have to either cut back production or to stockpile some of its diamonds until further notice from DeBeers.

The future prospects for the Namibian diamond industry depends primarily on De Beer's ability to regain control of the supply of diamonds. Unless the two top diamond markets; the United States and Japan, recover, the likelihood of growing demand is doubtful. In this case producers, including CDM, might be forced to keep on stocking their diamonds, a measure that can be very costly in the long run (Newsweek November 9, 1992). When it comes to future conditions in Namibia, CDM has resources that will allow diamond output to remain at around 1 mn carats annually from 1993 onwards, although this level may not be maintained much beyond 1995 from existing resources given a progressive fall in ore grades within the main onshore mining area. CDM's mining rights are valid until 2010 (Economist Intelligence Unit, 1992, p 59).

### Uranium

All uranium is produced by the Rössing Uranium Ltd. The UK's RTZ has a 46.5 per cent equity interest, and the other major shareholders include the South African Industrial Development Corporation (IDC), General Mining Union Corporation (Gencon) and Minatome of France. Several years prior to independence, Rössing transferred a 3.5 per cent equity stake, which controlled 50 per cent of the voting rights in the company, to a trust, which was reverted to the Namibian government (Economist Intelligence Unit, 1993, p 3).

Rössing has been the largest uranium producer in the world and the mine is very important to its parent company RTZ.<sup>4</sup> In 1982 it contributed 92 percent of RTZ's after tax profit, while representing only 4.5 per cent of its assets. Uranium from

Rössing is marketed by RTZ along with output from its other producing mines in Canada and South Africa. The Namibian uranium was primarily bought by Western Europe, Japan and Taiwan. Western countries have had two main reasons for buying their uranium from Namibia. One reason is the advantage of having supplies from a variety of sources. Another reason may be that some producers refuse to allow their uranium to be used for military purposes. South Africa was much less stringent about uranium from Rössing (Catholic Institute for International Relations, 1985, p 38 ).

Significant for the development of the uranium price is the strong downward trend. The price for uranium reached a peak in 1978 of 45 US dollars per pound.<sup>5</sup> This resulted from increased interest and beliefs on nuclear energy in Europe. Later during the 1980s demand for uranium proved to be less important than predicted, the safety of nuclear use was questioned. Also new mines and uranium deposits were opened in Canada and Australia. The weakening demand and the growing supply caused the spot price for uranium to decrease drastically throughout the 1980.

After 1989 the price has declined further as a result of increased supply from the formerly planned economies in Eastern Europe, the Soviet Union and China. In 1992 the spot price was down to a low of 8 USD/pound. Despite this unfavourable price development many uranium producers, including Rössing, have however secured their sales through long-term contracts signed when prices were high (Svenska Dagbladet, 5 May, 1991).

In the early 1980s Rössing signed contracts with their major customers, the United Kingdom, France, Japan, and West Germany. Rössing was, however, unable to sell on the North American Market due to sanctions against South Africa. Even with these contracts, Rössing has not produced at its full capacity of 5 000 tons of uranium oxide per year. Under the Nuclear Energy Act of 1982, details about Namibia's uranium industry have been kept secret.

Hence, there are no exact production figures. In the beginning of the 1980s produc-

tion was estimated at around 5 000 tons. In 1983 output levels decreased to about 3 700 tons and remained at that level more or less until the beginning of the 1990s. Over the last two years production has been cut back further, this reflects an oversupply on the world market, the inability to benefit from the lifting of South African sanctions, the historically low prices and the company's inability to win new long term contracts to maintain economic viability at existing output levels (Interview with Mr Dytoit, Rössing Uranium Limited, 25 March, 1993). Between 1990 and 1992, production was reduced by almost 40 per cent. See Table 4. Uranium's contribution to export earnings has, as a result of long-term contracts, not been affected so much by the decline in the uranium price. While the uranium price has slackened throughout the 1980s, uranium's contribution to export earnings increased in the first half of

**Table 4**  
**Uranium: Production and share of Namibia's export.**

Year	Share of exports per cent	Output (t) uranium oxide
1980	22.7	5 000
1981	28.2	-
1982	34.5	-
1983	28.6	3 700
1984	35.0	3 700
1985	33.6	3 400
1986	34.4	3 500
1987	30.0	3 500
1988	18.7	3 400
1989	23.6	3 680
1990	16.0	3 800
1991	10.4	3 185
1992	-	2 190

Note: Output of uranium oxide estimated figures.

Sources: The Economist Intelligence Unit 1992, Economic review 1992.

the 1980s. Since 1986 the value of exported uranium has, however, declined contributing only 10.4 per cent of total Namibian exports in 1991.

The world market may improve in the mid-90s if, as the London based Uranium Institute forecasts, there is a draw down by nuclear power utilities of prevailing high inventory levels. Rössing might then need to expand capacity by more than is currently envisaged. The company has secured a contract to supply Electricité de France, a previous customer, with 4 700 tons from 1995 and onwards, although by itself even this may not enable the mine to move back to capacity output levels in the absence of further contracts or an overall improvement in the market. Rössing itself has reserves of around 120 000 tons which are adequate for continued mining until at least the second decade of the next century (Economic Intelligence Unit, 1992, p 60).

### Base Metals

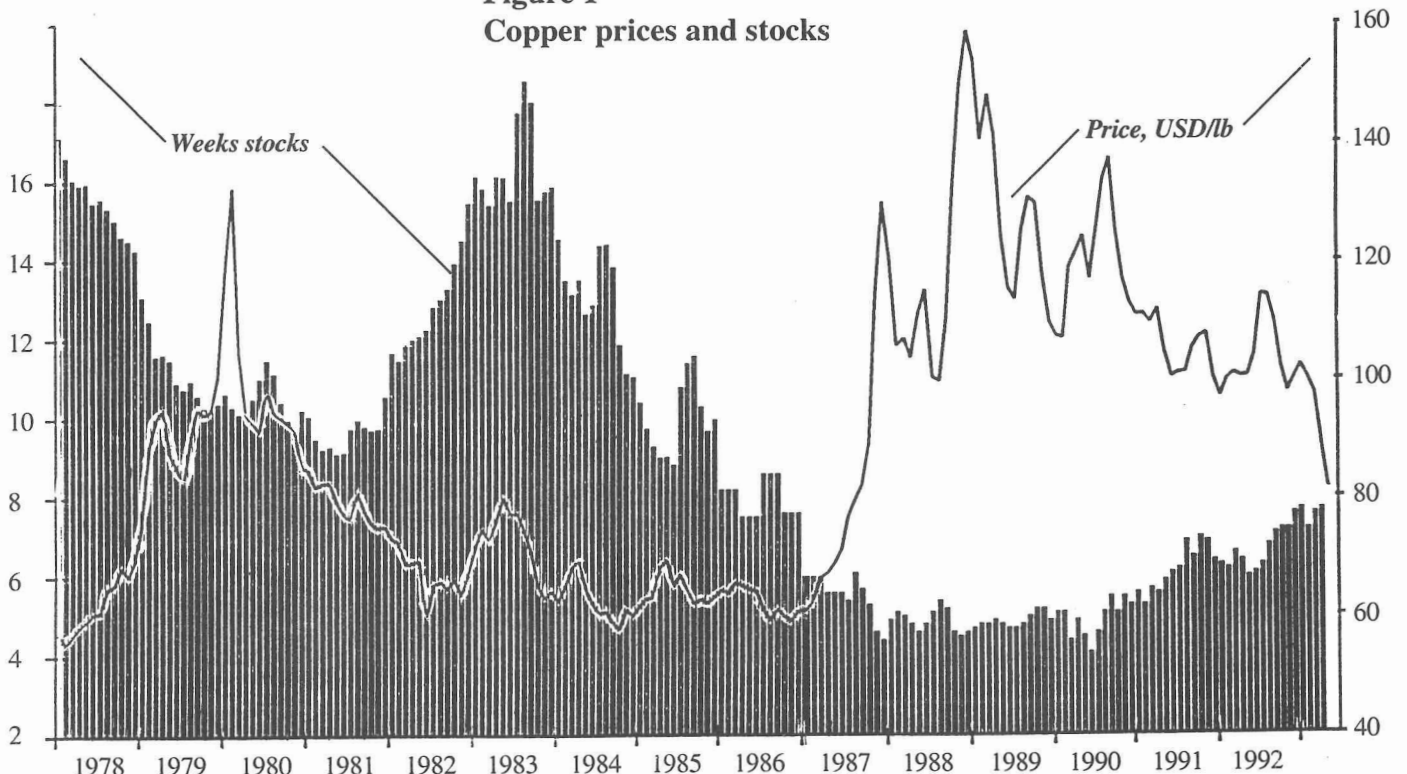
Namibia is Africa's second largest producer of lead and the continent's fourth largest producer of zinc and copper (Africa South of Sahara, 1991 p 735).<sup>6</sup> Of these metals, copper is by far the most important to Namibia. Tsumeb Corporation Limited (TCL) is Namibia's largest base minerals producer and operates mines at Tsumeb and Kombat and it has seventy per cent of ownership in the Otjihase mine. More than seventy per cent of the Namibian base-metal output comes from TCL. It produces copper, lead, cadmium and zinc. TCL is a wholly own subsidiary of Gold Fields Namibia (GFN). The majority shareholder is Gold Fields of South Africa (GFSA) and RTZ holds a minority interest. The other major base-metal mine, Rosh Pinah is operated by Iscor - another South African company (Economist Intelligence Unit, 1992, p 29).

The prices that Namibian producers of copper, lead and zinc receive are governed by the London Metal Exchange and are influenced by speculative trading as well as by world supply - and - demand factors.

World copper, lead, and zinc consumption is positively related to overall economic growth. An analysis of individual national consumption is not as clear-cut as it is for the world as a whole. In the early stages of a country's economic development, the metal intensive industrial sectors tend to grow at a faster rate than the economy as a whole. However, as an economy matures, the service and high technology sectors grow at a faster rate, and economic growth becomes less metal intensive. We would thus expect a trend toward declining metal intensity in the industrialised countries.

The intensity of consumption in the developing countries has risen between the

**Figure 1**  
**Copper prices and stocks**



Source: Boliden Mineral AB, Stockholm 1993.

1970 and 1988. Economic growth in many newly-industrialised countries in Asia and Latin America has reached "take-off" levels where growth becomes more oriented to domestic demand and less reliant on exports. Demand for industrial metals in these countries should therefore, continue to rise strongly as the industrial base of these countries broadens to match the more integrated bases of the industrialised countries.

Copper, lead, and zinc have all been subjected to stockpiling, a fact that has affected the prices of these metals. Downturns in demand lead to a build up of market stock because producers are relatively slow to cut back production. As a result, the price will fall. This also implies that a future rise in demand will not affect the price immediately because of the lag imposed by the stocks which first must be sold out (Shearson Lehman Brothers, 1990, p 44 ff).

### Copper

The economic recessions of the mid 1970s and early 1980s caused sharp build-ups in

**Table 5**  
**Copper: Production**  
**and share of Namibia's export**

Year	Output (t)	Share of exports per cent
1981	39 719	3.7
1982	49 768	5.3
1983	54 238	6.4
1984	48 573	6.4
1985	47 611	7.5
1986	50 145	5.3
1987	37 653	6.1
1988	42 163	9.4
1989	37 978	8.3
1990	33 190	7.5
1991	31 928	5.9

Source: Ministry of Mines and Energy 1992

market stocks. This led to a sharp fall in prices. See Figure 1. Conversely, prices did not start to recover significantly until market stocks had fallen back to relatively low levels. Apart from the high price for copper in 1980, the first half of the decade experienced weak world market prices. The reason for this was a downward trend in copper intensity in the industrial countries. In addition to this trend, copper demand has suffered from losses caused by substitutions of other materials<sup>7</sup>. The world supply of copper remained relatively constant in the first half of the 1980s.

The price of copper experienced a sharp upward turn from 1987 to a peak in 1989. This was the result of successive high levels of demand in all markets except the USA. This development was reflected by a strong growth in car production and capital spending in Western Europe and Japan. During the 1980s the developing countries experienced a sharp rise in copper intensity. Total world copper supply increased significantly in 1988-89. However, this did not lead to any oversupply because of the increased demand. As a result market stock piles remained at low levels in both years (Shearson Lehman, 1990, p 1 ff).

Over the last three years, the price of copper fell. This mainly resulted from increased supplies from developing countries such of Chile, Zambia, and Zaire. In addition, net importers from the former Eastern Block countries were 20 per cent higher during the first half of the 1992. Consumption was however not sufficiently so to absorb the additional supplies coming forward (Chamber of Mines, 14th Annual report 1992). The world market outlook for 1993 indicates a reasonably balanced situation. Both supply and demand are likely to grow by 1 per cent. Growth in the electrical and construction sectors in the West is expected to remain weak but positive (The Namibian, 24 February, 1993).

Until 1987, copper's contribution to Namibian export earnings averaged about 6 per cent. As the world market price for copper improved in 1988-89, copper's share of exports increased to almost 10 per

cent in 1988. With the following turn of the metal price also copper's contribution to export earnings has fallen. See Table 5. The reason behind the recent development is also that copper production in Namibia has declined caused by depleting ores and lower grades of copper.<sup>8</sup> As a result of this threat, the main copper mine in Namibia, the Tsumeb mine might close down by the end of 1993. A new copper mine, owned by TCL, Tshudi, will probably start production at the beginning of 1994 (Interview with Tony DeBeer, General Manager at TCL, 29 March, 1993).

### Lead

Over the 1980-1988 period, lead consumption in all the major industrialised countries declined. Apart from the general trends toward more efficient use of metals, the decreasing consumption of lead also reflects the growing environmental concern about lead's use in some applications, such as lead in petrol and paints. The consumption in the developing countries has been rising over the same period, however not sufficiently to offset the declined demand in the industrialised countries. This was especially significant in Asia, where South Korea and Taiwan emerged as relatively high consumers of lead. As a consequence, the world market price for lead fell from relatively high levels of 1980 and 1981 and did not recover until the end of the decade. The improvement in lead price was primarily caused by reduction in world lead supply (Shearson Lehman, 1990, p 21).<sup>9</sup>

Prices during the last years have been volatile from a relatively high base. See Figure 2. 1991 experienced a sharp decline in world market prices for lead. The demand for the metal in the replacement battery sector held up well in the face of adverse economic conditions in evidence throughout much of the industrialised world in 1992.<sup>10</sup> Other fields of application continued to report sluggish demand. Supplies might increase with renewed Eastern Block selling, therefore a further drop in prices is likely for 1993 (The Namibian, 24 February, 1993).



Lead's contribution to Namibia's total export earnings has averaged about 2 per cent over the time revised. However, it is more relevant to look at how the value of lead exports have changed over time. In the first half of the 1980s sales value were low reflecting the weaker price for the metal. Conversely as prices improved in the end of the decade, the sales value of lead also increased. The 1980s continual weakening of the Rand also had a positive impact on the sales value. See Table 6.

After the peak in 1989-90 the prices and value of lead exports have fallen. This is also reflected by the reduced production of lead over the last two years, which has been caused by lower grades of lead in the main Namibian lead mine, Tsumeb.<sup>11</sup> With the closure of the Tsumeb mine by the end of the year, the future of lead production in Namibia is uncertain.

### Zinc

For the years, 1979 through 1982, the zinc market was badly affected by the overall economic recession. Over the 1970-1988 period the zinc intensity of industrial production and GNP declined in many of the

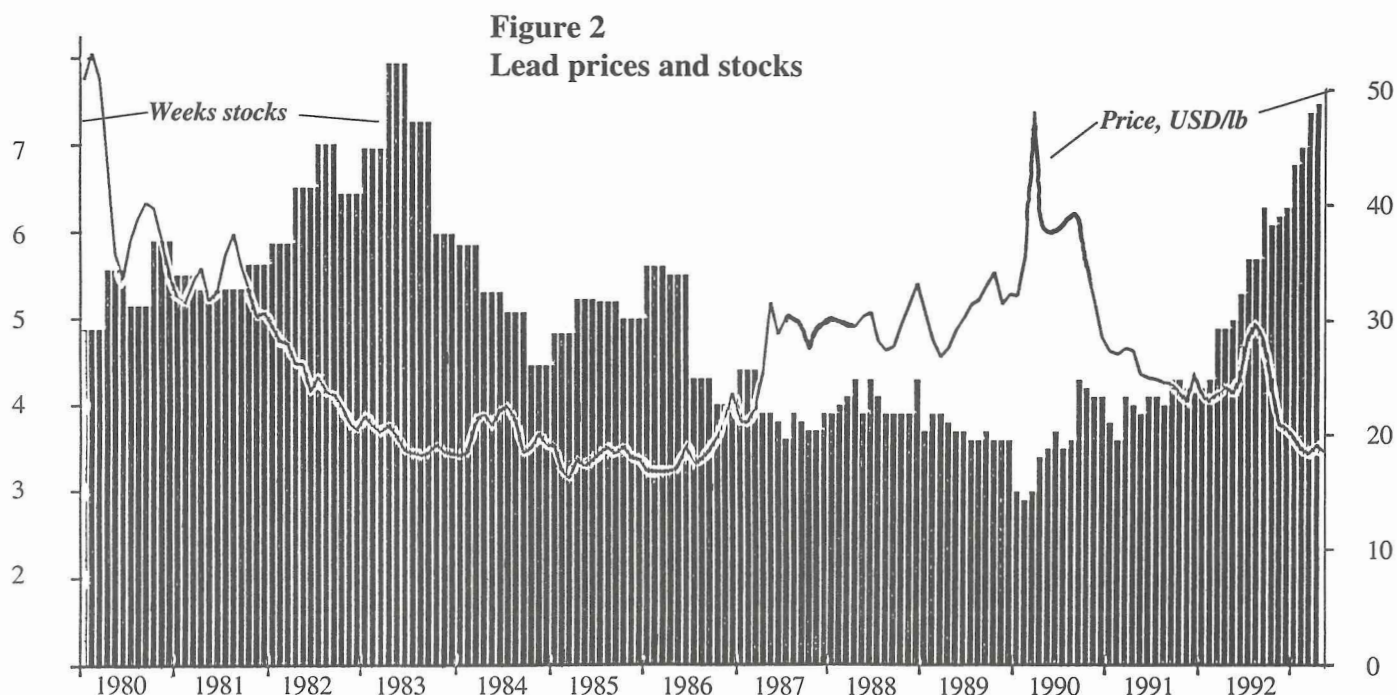
industrialised countries. The reasons behind this development have been; the substitution of zinc by alternative products, the trend towards more efficient use of the metal and changes of technology in zinc-using industries. The zinc price saw a sharp upswing in 1988, because of interruptions in Peruvian output. See Figure 3. Also expansion in the newly industrialising countries underpinned zinc consumption growth during the end of the 1980s. In 1989 overall consumption was affected by the North American market, where the poor performance of the residential construction and car industries led to a decline in demand (Shearson Lehman, 1990, p 70).<sup>12</sup> Since 1990 the price for zinc has declined. This negative development reflects the recession in the main economies, especially in Japan, and the large stock of zinc that has been built up since 1992 (The Namibian, 24 February, 1993).

The value of Namibian zinc exports was modest until 1988. For the two following years, its contribution to Namibian exports rose as domestic production increased and zinc prices improved. The decreasing value

**Table 6**  
**Lead: Production and share of Namibia's export.**

Year	Production (t)	Per cent of export earnings	Total lead sales value (MZAR)
1980	-	3.0	33.1
1981	41 729	2.2	43.2
1982	40 590	2.1	23.5
1983	35 416	1.9	19.5
1984	28 930	1.5	18.0
1985	38 511	2.0	33.1
1986	40 047	1.7	37.1
1987	40 634	2.4	49.8
1988	44 447	2.6	62.9
1989	44 183	2.7	78.9
1990	35 129	2.8	78.0
1991	33 367	1.6	54.0

Source: Ministry of Mines and Energy 1993.



Source: Boliden Mineral AB, Stockholm 1993.

**Table 7**  
**Zinc: Production**  
**and share of namibia's export**

Year	Output (t)	Sales value (MZAR)	Share of exports per cent
1981	57 844	43.0	4.2
1982	61 100	58.1	5.3
1983	56 316	29.3	2.7
1984	56 544	-	-
1985	57 495	24.6	1.4
1986	65 518	28.6	1.3
1987	75 977	26.6	1.3
1988	71 655	69.1	2.8
1989	79 805	103.3	3.5
1990	72 411	99.1	3.6
1991	68 099	82.0	2.5

Source: Ministry of Mines and Energy 1993.

of sales in 1991 is rather a result of lower metal price than a decrease in Namibian zinc output. See Table 7.

**Linkages in Namibian mining**

More or less all of Namibia's major minerals experienced downturns on the world market during the 1980s and more important in the beginning of this decade. These unfavourable developments have had a negative impact on the mining industries role in Namibia's economy. To broaden the analysis of the Namibian mining sector it is important to consider to what extent the mining industry is integrated to other parts of the economy through various linkages.

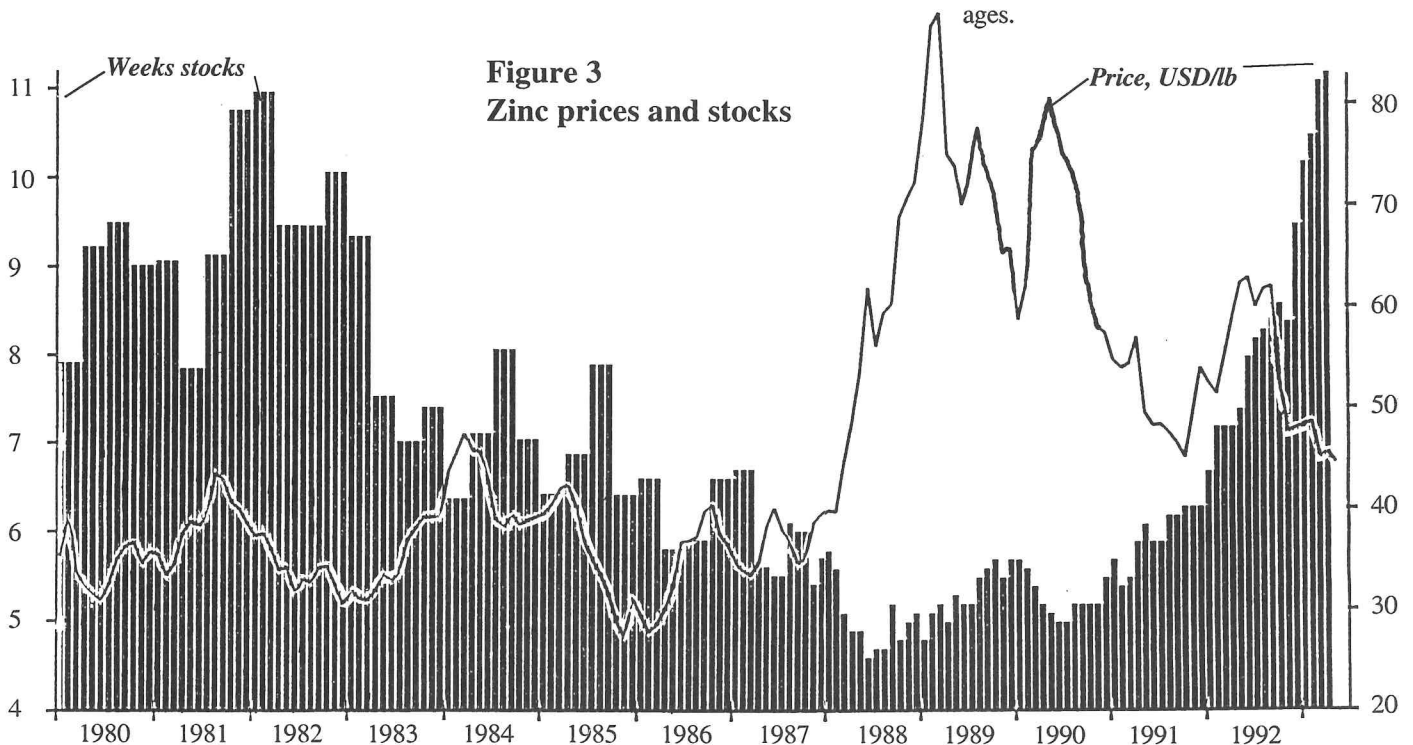
First, backward linkages create an opportunity for other yet undeveloped sectors to grow as the mining industry as such demand various inputs. Second, forward linkages like the growth of a processing industry allows for increased diversification and a more balanced economy. Third, consumption linkages arise through the relatively high incomes generated by the sector's employees. Fourth, empowerment linkages occurs hopefully as the mining in-

dustry trains its employees in technology, thus enable them to grow professionally and intellectually. Fifth, fiscal linkages like taxes provides the government with well-needed revenue.

**Backward linkages**

Backward linkages arise from the fact that when exports grow they can provide stimulus for expansion in input supplying industries and hence stimulating other parts of the economy. When measuring Hirsh-man's backward and forward linkages properly input-output tables should be taken into consideration.<sup>13</sup> However, our body of information does not allow us to make such a profound analysis. When investigating Namibian mining's backward and forward linkages, we can therefore only base our analysis on empirical information.

Relevant for backward linkages in Namibian mining is its links to equipment supplying industries and the physical infrastructure because these factors are important inputs. Labour is of course a very important input but we have chosen to discuss its role in the context of consumption linkages.



**Figure 3**  
**Zinc prices and stocks**

Source: Boliden Mineral AB, Stockholm 1993.

*Beach mining in Namibia,  
construction of new sea wall.*

The Namibian mining industry is an enclave in the sense that its not very well linked to local input supplying industries. As mentioned before Namibia does not have a well developed manufacturing sector since the economy over the years was designed to serve the economic interests of South Africa. The equipment used today in the Namibian mines is technically advanced and most of it has to be imported. The country is lacking in the appropriate technologies and in the financial resources to manufacture these inputs within the country. Most of Rössing's inputs for its uranium production are imported from overseas. Trucks are bought from supplying industries in the United States and Canada. Other equipment comes from Germany. Rössing has some local contracts with manufacturers in Namibia, but these are on a small scale (Interview with John Dytoit, Public Relations Manager, Rössing Uranium Limited, 25 March, 1993).

CDM which is South African owned gets most of its equipment directly from or via South Africa. Most of the equipment used at the TCL mines today is old and

dates back to the 1960s. However all new equipment that the company uses are imported from South Africa. Some after market repairs are done locally. (Interview with Jan Du Plessis, Financial Manager, Tsumeb Corporation Limited, 1 April, 1993).

Another necessary input to the mining industry is energy. The mines require large amounts of electricity which to a large scale is produced by coal and diesel. At independence all coal and oil were imported either directly or through South Africa. This limit the linkages with the internal energy sector. In recent years measures have however been undertaken to develop and stimulate this sector. At present part of Namibia's power supply is generated from the Ruacan, a Hydroelectric Power Station on the Kunene River and from the power station near Windhoek. This represents 38 per cent of the national energy consumption. A possible source of additional power is the Kudu Gas field off the Atlantic coast in the south of the country. Namibia also has promising geological structures for oil discoveries on and off-shore in the north. A

third potential resource of energy is the Epupa hydro-electric on the Kunene River. These projects are all very costly and require technical capabilities to develop. Consequently, the government has taken initiatives to enact necessary laws and create the institutional framework needed to attract foreign investments (Namibian Review, 1992, p 18ff). The development and utilisation of these local-scale sources of energy would strengthen the mining industry's backward linkages. This would stimulate new industries and provide employment opportunities.

It is also important to consider mining's linkages to transportation. Since the distances are long in Namibia mining companies spend much money on transportation. Transport services were originally operated by South African companies. But in 1988 the government supported the creation and development of state co-operative, Trans Namib Limited, which controls the largest trucking operations in the country as well as railroad, air transport, and maritime shipping firms. In 1989 measures were undertaken to protect Trans Namib from the competition of South African-owned and operated trucking firms. New permits for transportation were frozen on fourteen commodities between specific origins and destinations. The new amendment protects both the railroads and existing trucking firms from the competition from new entrants. Tsumeb Corporation Limited is today the biggest consumer of the Trans Namib Railway. This implies that the mining industry, by principally using the services of Trans Namib, hold strong backward linkages to the transport sector. Through employment generation and increased state earnings, this stimulates other parts of the Namibian economy.

**Forward linkages**

Forward linkages arise when the primary product is processed since the output from one sector becomes an input in an other. Through processing value is also added to the primary export.



Unfortunately, most of the Namibian minerals are exported in an unprocessed state. At the moment Namibia has invested modestly in smelters, refineries, and processing plants, apart from facilities at Tsumeb and some products that are treated beyond the concentrate stage. Minerals that are partially processed or exported in finished conditions include uranium, copper, lead and gold, these account for about thirty per cent of all mineral exports. Currently, uranium ore is processed into uranium oxide at Rössing. Further processing than this stage is too complex and costly (Commonwealth Secretariat, 1993, p 104).

Most minerals are marketed in concentrated forms or as rough materials. Diamonds which are the most important mineral<sup>14</sup> leave Namibia as rough stones for sale on the international market (Commonwealth Secretariat, 1993, p 105). An attempt was made to Namibianize the diamond industry. At the time of independence, CDM started sorting and adding value to diamonds in Windhoek (Ericsson, 1992, p 35). If CDM could be forced to give up some of its control of those processes diamond cutting and polishing would develop into a small industry (Sparks-Green, 1992, p 124). Apart from base-metals, others are exported as concentrates.

The future of the only smelting complex in Namibia, the plant at Tsumeb where blister copper is produced and lead refined, is insecure. The main feed for the Tsumeb smelters is currently supplied by from the Tsumeb and Kombat mines (copper and lead concentrates, 30 per cent copper respectively 30 per cent lead), Otjihase mine (copper), and the Rosh Pinah mine (lead concentrates) (Commonwealth Secretariat, 1993, p 75). Since output of lead concentrates from the TCL mines has drastically declined, the company imports today large amounts of lead from South Africa (21 000 tons in 1993) (Interview with Jan Du Plessis, Financial Manager at Tsumeb Corporation Limited, 1 April, 1993).<sup>15</sup>

Table 8 shows how production at the lead smelter has declined from its peak in 1988 to 33 400 tons in 1991. Following

output levels of the TCL mines, copper production has declined gradually. The smelting operations involve high fixed costs. To be able to cover the production costs, the smelter has to run at full capacity twenty-four hours a day. The Tsumeb mine is an important source of feed to the integrated copper and lead smelter. Since its ores are depleted, the mine will close down in the end of 1993. Enough copper concentrates will probably be provided by TCL's other mines (Interview with Tony DeBeer, General Manager, Tsumeb Corporation Limited, 29 March, 1993).

The company is planning to start mining copper at a new ore body at Tschudi with support from the SYSMIN facilities. SYSMIN funding has also been approved for extension of existing mining at the Otjihase copper mine, which if realised would increase copper metal production capacity from around 14 000 tons per year to 20 000 tons per year and together with Tschudi would compensate fully for the

lost production from Tsumeb (The Namibian, April 4th, 1993).

According to Rainer Gever of the Chamber of Mines, the lead smelter might have to close down in a few years. He fears that there will not be enough good quality lead concentrates to feed it in the future. With the closure of the Tsumeb mine, other sources have to be developed to keep the lead smelter running in the future. One option for TCL is to treat some slime dams, which have grown since the beginning of the century. These dams contain both lead and copper. If developed successfully this process could supply the smelter for about 5-6 years (Interview with Tony DeBeer, General Manager, Tsumeb Corporation Limited, 29 March, 1993). Other inputs will have to come from the Kombat and Rosh Pinah mines and from imports. According to Rainer Gever, lead prices have been decreasing (see Figure 4) and they will probably never recover again. Since the lead smelter is integrated with the cop-

**Table 8**  
**Tsumeb smelter/refinery output, 1986-1991**

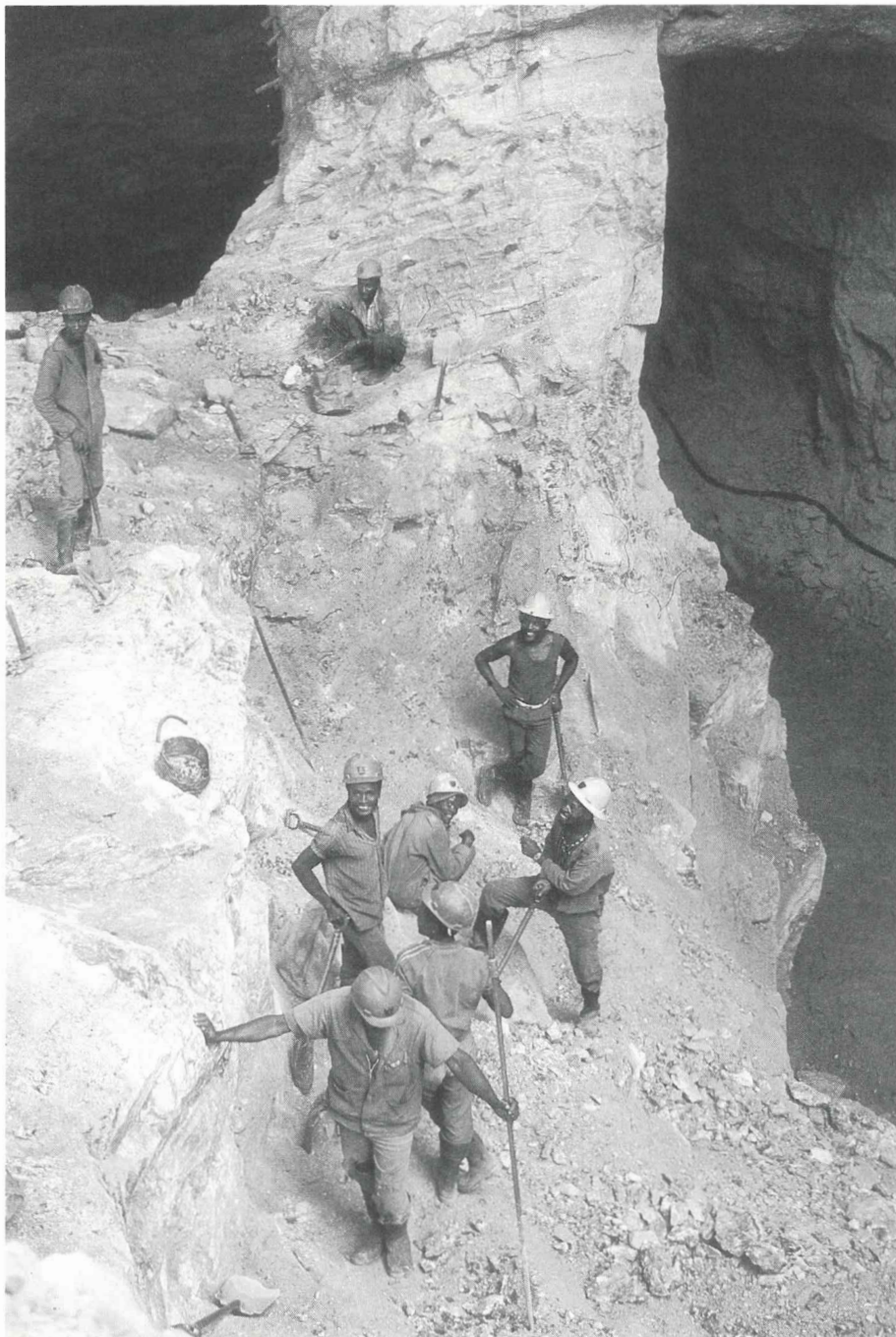
	1986	1987	1988	1989	1990	1991
<b>Blister copper (kt)</b>	<b>50.1</b>	<b>37.3</b>	<b>42.2</b>	<b>37.9</b>	<b>33.2</b>	<b>33.5</b>
- own mines	42.2	30.7	33.2	28.1	29.1	31.5
- other sources	3.5	4.8	6.8	8.6	3.5	1.4
- returned blister <sup>1</sup>	4.5	2.2	2.2	1.3	0.5	0.6
<b>Refined lead (kt)</b>	<b>40.0</b>	<b>40.6</b>	<b>44.4</b>	<b>44.2</b>	<b>35.1</b>	<b>33.4</b>
- own mines	25.3	13.4	14.4	13.5	11.3	8.0
- other sources	14.8	27.2	30.0	30.7	23.8	25.4
<b>Contained silver (t)</b>	<b>105.1</b>	<b>95.4</b>	<b>108.5</b>	<b>109.7</b>	<b>93.1</b>	<b>91.9</b>
- own mines	68.8	59.8	67.7	59.0	45.1	55.5
- other sources	36.3	35.6	40.8	50.7	48.0	36.4
<b>Gold (kg)</b>	<b>184.0</b>	<b>172.0</b>	<b>195.0</b>	<b>270.0</b>	<b>181.0</b>	<b>148.0</b>
<b>Refined arsenic trioxide (t)</b>	<b>2 200</b>	<b>1 900</b>	<b>3 000</b>	<b>2 400</b>	<b>1 600</b>	<b>1 800</b>
<b>Refined cadmium (t)</b>	<b>61.0</b>	<b>51.0</b>	<b>106.0</b>	<b>88.0</b>	<b>69.0</b>	<b>67.0</b>

**Note:** Totals may not add precisely due to rounding. 1. Concentrates from own mines smelted at O'kiep smelter in South Africa.

**Source:** Tsumeb Corporation Limited, Annual Reports.

per smelter, closing the latter would mean that the copper section would have to be modified to process only clean copper concentrates. The concentrates from the Kombat and Tshudi mines are clean, but Rosh Pinah gives concentrates that contain zinc. Zinc is, with current technologies too

expensive to extract and TCL will therefore have to import clean copper concentrates. This means that the company will have to compete on the world market with smelters in other countries (Interview with Rainer Gever, General Manager, Chamber of Mines, 5 April, 1993).



### *Small scale amethyst mining.*

Steve Galloway at the Ministry of Trade and Industry stresses that it is very important to Namibia's base-metal industry that the smelter will proceed in the future because it is the only one in the country. Base-metal deposits have been found in the still unexplored Kaokaland (see map) If the Tsumeb smelter did not exist, no one would be interested in that area. All concentrates would also have to be exported, which means that the country would lose a lot of value added income (Interview with Steve Galloway, Ministry of Trade and Industry, 20 April, 1993).

The low degree of processing in Namibia both in the past and present reflects established export patterns and the absence of forward linkages in Namibian mining to other parts of the economy. As with backward linkages, problem arises with the country's small industrial base. As a result other countries process the majority of Namibia's minerals. To develop existing processing plants and to establish new ones requires foreign-trained managers and technicians and large investments. Namibia has today the advantages of access to international markets, required raw material, and an efficient transport system. If proved profitable the government should offer incentives to attract investment to processing plants since this would develop the local industrial base, integrate mining to the rest of the economy, and add value to mineral exports

### **Empowerment linkages**

Despite a long mining tradition and progress toward recent democracy, there is still a severe shortage of skilled Namibians at all levels of the mining industry. In the formal sector of the mining industry, expatriate personnel hold a large share of the professional and technical management positions, while low skilled black Namibians constitute the majority of the miners (World Bank 1992, p 33). The reason for this is a lack of training facilities in Namibia. All graduate level training is received at foreign universities. Also the Namibian government has not offered the

mining industry special tax incentives to develop manpower.

Faced with the shortage of skills in areas when technical innovation is needed, the leading mining companies have developed a comprehensive range of training programmes that are tailored to their own requirements. Since the number of mining employees has been declining, it is important that released manpower can be transferred either to other mines or to other sectors. However, there has been a problem in transferring labour. The training programs have not worked on a national basis. Lately the government has developed a more unified training system, by studying requirements in each industry and incorporating them into one nationally accredited training system (Interview with Mr Shityuwete, Deputy Director of Ministry of Labour and

Manpower Development, 25 March, 1993).

The government has also supported and participated in the establishment of the Namibian Institute of Mining and Technology, a project initiated by Rössing Uranium Ltd. The first phase of the development, involving mainly artisanal training in mining-related fields, was completed at the end of 1991. The institute was then handed over to the Namibian state on March 21, 1992 (Ericsson Magnus, 1992, p 51).

Theory implies that the nature of the production function and the degree to which the export goods are processed also have an influence on rates of learning and technological spread, which through spill-over effects can benefit other sectors of the economy. Investments in human capital will lead to a more creative labour force

and greater labour productivity. In a longer perspective, as forward linkages are further developed, an empowerment strategy may decrease training costs and enable a higher employment rate for Namibian nationals (even in technologically advanced positions). Given the fact that Namibia has been subject to apartheid policies, empowerment linkages are welcomed not only for purely economical reasons but also for cultural, social, and political reasons.

### Consumption linkages

Due to fewer people being employed, theory implies that countries exporting capital intensive products will experience poorer consumption linkages. This reduces the domestic consumption. To analyse the mining industry from this aspect consideration will be given to employment figures

**Table 9**  
**Employment and real remuneration in Namibia**  
**(Current prices)**

Year	Total mining employees	Total formal employment <sup>1</sup>	Remuneration /labourer in mining <sup>2</sup>	Remuneration /labourer in total economy <sup>2</sup>	Mining as per cent total economy <sup>1</sup>	Wages as per cent of minings share of GDP
1980	19 766	-	7.115	-	23.0	22
1981	19 240	-	7,384	-	20.4	36
1982	17 300	-	7.285	-	17.6	36
1983	16 595	159 405	7.673	4 811	17.7	40
1984	15 624	141 427	7.432	4 335	15.9	37
1985	14 869	155 631	7.886	3 893	16.2	23
1986	14 428	-	7.918	-	16.0	22
1987	12 905	-	8.314	-	14.3	33
1988	13 073	171 724	8.662	4 064	15.2	28
1989	12 776	-	9.151	-	15.9	28
1990	13 605	-	9.247	-	15.3	44
1991	11 232	170 468	11.011	4 022	14.8	43
1992	11 441	-	-	-	-	-

Notes: 1. Excludes mining. 2. MZAR. Includes fringe benefits.

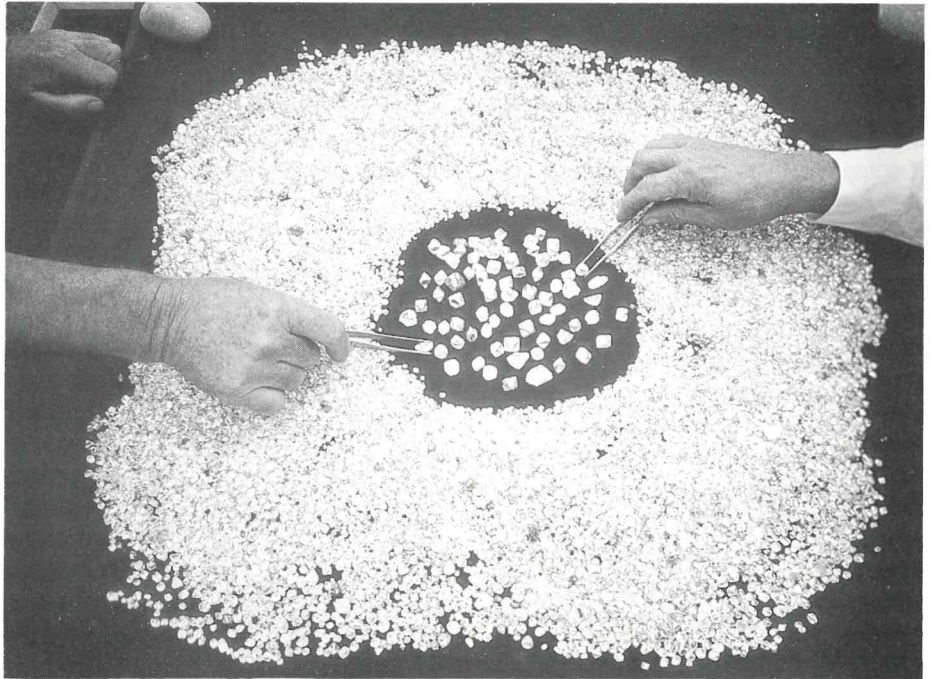
Sources: Chamber of Mines, 14th Annual Report, 1992; Linné Eriksen, 1988; World Bank, 1992.

### *Selection of gem diamonds.*

and wage rates in this sector in order to compare them with the other sectors in the Namibian economy.

From employment figures for the last ten years, it can be established that total employment in Namibian mining has decreased almost by 50 per cent, from 19 776 in 1980 to 11 441 in 1992. The mining industry employs today about 6 per cent of the total labour force.<sup>16</sup> According to Rainer Gever, General Manager at Chamber of Mines in Namibia, the main reason for this decline in mining employment is that the mining companies overall have turned to more capital-intensive production. Rainer Gever points to several reasons for this trend of greater capital use in mining production. In the past, labour was relatively cheap. This allowed mining companies to be relatively labour intensive. In 1985 the Miner's Union of Namibia (MUN) came into being and asked for an average wage increase of 150 per cent per year. Consequently, the companies were forced to rationalise and increase mechanisation of their production. The facts that the mineral market in the world has deteriorated and mining wages have increased have put pressures on the mining companies to become more capital intensive in order to stay competitive. Employees represent the largest single cost factor for mines (30 per cent of total production costs). In order to be able to sell their products against international competition, it is economically essential for mines to keep employment down and continually find more efficient ways to produce. Another reason for a declining number of mining employees has been mine closures and output reductions. As world market conditions have deteriorated deposits were no longer profitable enough to continue mining.<sup>17</sup>

A glance at the real remuneration per mining employee over the last ten years compared to the real remuneration per employee in the rest of the formal sector of the economy, shows how wages in mining have developed in relation to other sectors of the economy. Table 9 notes how real wages in mining have increased by 55 per



cent between 1980 and 1991. In contrast wages in the rest of the economy have decreased by 20 per cent between 1983 and 1991. Over the same period mining increased by 43 per cent.

Higher labour costs in mining are also stated in the table above as mining's contribution to GDP. Wages accounted for a higher part of mining companies costs over the 1980s. Moreover, wages seems to have increased even more during 1990 up to 1991. This development has two explanations. First, there was a falling share of taxes paid out by mining companies. Second, there was higher wage costs in the mining sector. The fact that Namibia is dependent on investments in its mining sector makes it very vulnerable to any negative development that lowers the country's competitiveness, such as higher labour costs.

It is possible that an active labour union has managed to push for some increase in mining wages, but as the unemployment rate in Namibia has averaged about 30–40 per cent over the last years this should have abated the possibility of realising the wage claims (The World Bank, 1992, p 15). A

more probable explanation must therefore be sought in improved labour productivity in the mines. Wage lifts to such an extent is hardly feasible unless labour become more efficient, either through investment in human capital or in more efficient equipment. The lack of skilled manpower in Namibia excludes however that the higher wages in mining should have been caused by investments in human capital. Investments in machinery and equipment have been undertaken over the last decade. In conclusion, this increased use of capital in the mining industry has increased mining wages and decreased mining employment.

With a declining number of miners, the consumption linkages in Namibian mining has become poorer. The table above indicates that mining's share of total cash remuneration has declined. In 1980 the share was 23 per cent declining gradually to about 14.8 per cent in 1991. The deteriorating figures reflect the decline in the number of mining employees, this more than offset the increases in overall wage and salary levels. As a result, the purchase power of salary-earners in the mining sector has declined about 12 per cent over that time.<sup>18</sup>

Even though wages in Namibian mining were almost three times higher than the average wage in the rest of the economy in 1992, it only employed 6 per cent of the total formal labour force. Considering that the mining industry dominates the Namibian economy in terms of export earnings and GDP, it is remarkable that mining presents such weak links to employment and remuneration.

The big difference in wages between the mining sector and other sectors could become a problem if less productive sectors claim same wages. Higher labour costs in these sectors would lower the competitiveness of the products. In order to prevent this dilemma, the Namibian government in the Labour Act from 1992 stated that wages and remuneration should be calculated according to the profits made of each company (Interview with Mr Shityuwete, Deputy Director of Ministry of Labour and Manpower Development, 25 March, 1993).

Declining employment figures in the mining industry make it an urgent issue for the Namibian government to make sure that the rapidly growing labour-force<sup>19</sup> in the country will be absorbed by other sectors of the economy in the future. The capital intensive production process in the mining sector gives no guarantee to increasing employment figures caused by improvement in world market demand and prices for Namibian minerals.

### **Fiscal linkages**

This section shows how Namibian mining's contribution to government revenue has evolved over the past twelve years. Government income from the mining sector is derived from prospecting rentals and from taxing the profits of mines. Taxable profit in the mining industry is the balance left after the deduction of operating costs and capital expenditure from sales income. From 1980s to 1991, mining taxation in Namibia was conducted under the "old" tax regime. In 1992 the Namibian government presented a new taxation system.

At the time of independence, Namibia inherited a tax system which differentiated tax rates among the minerals. This took into account new investments in the industry or changes in the financial performance of established mines. In the case of diamond mining the government took 55 per cent. In addition, there was an export duty, irrespective of the profit margin, of 10 per cent of the market value of all diamonds shipped and sold. Taxation accounted for seventy per cent of diamond mining pre-tax profit.

The government has been more sensitive to base-metal mines. As a result of weak market conditions the base-metal industry paid 42 per cent of their profit in taxes. With the development of the Rössing mine in the mid 1970s a sliding scale formulae for uranium was introduced. The tax formulae for uranium mining was based on the ratio of profit to total sales; the smaller the profit compared to sales, the lower the tax rate and vice versa. Including a surcharge, the maximum rate was 63 per cent. On top of these taxes, any dividends paid to non-resident or foreign share-holders in mining companies was taxed at a rate of 15 per cent. As an incentive to mining development, the government granted tax relief to new mines until the cumulative revenues from sales exceeded the combined costs of development and their operations. In the case of established mines, capital expenditure<sup>20</sup> was written off the years in which it was incurred (Commonwealth Secretariat, 1993, p 179ff).

Overall mining, pays tax at a higher tax rate than any other sector of the economy. It has been the single most important source of tax revenues. With the mining sector's stagnation, however, its share has declined. In the table below stating mining's contribution to government revenue in 1980 to 1991, taxes are paid according to the traditional tax system presented above. Of Namibia's minerals, diamonds have been the most important source of government revenue. Revenues from mining as a percentage of total public revenue have declined since 1981. It provided over 50 per-

cent of total taxes paid in Namibia in 1981 and paid 12 per cent in 1991. Due to the worst recession since World War Two mining's percentage of total revenue decreased dramatically down to 10.9 per cent in 1983. This had a negative effect on the world market demand for minerals (Mining Mirror, Vol. 4, May 11, 1992). In 1984 and 85 the figures rose again. This was due to a diamond tax increase of 55 per cent. During the following years, the production of diamonds increased and diamond prices improved. As a result, mining's share of government revenue increased. Over the last three years, mining taxes have deteriorated to a low level of 12 per cent in 1991. The reasons behind this poor performance can be explained by the lower profitability at Rössing and the impact of capital redemption allowances on the tax liability of diamond mining due to the commissioning of the mines at Aucas and Elizabeth Bay during 1989-1991. See Table 10.

Taxes share of mining's contribution to GDP have also decreased during the first half of the past decade reflecting a combination of higher labour costs and lower profitability at the Namibian mines.

The later development was not solely mining related. Since independence the source of government revenues have been broadened and certain sectors have made a significantly larger contribution to the overall amount of revenue collected. These include a considerably increased contribution from customs and excise from the SACU customs pool; external grant aid flows from bilateral donors; larger receipts from the general sales tax; and increases in certain categories of departmental revenue (Commonwealth Secretariat, 1993, p 192).

Since direct taxes paid by mining companies have contributed an average of 25 per cent to total public revenue over the last decade (1980-1991), Namibian mining held relatively strong fiscal linkages. Even though mining still represents a large source of government revenue, fiscal linkages in Namibian mining have deteriorated since 1987. This reflected the declining mining profits and the other sector's



greater contributions. Furthermore, since the mining companies do not pay tax on capital expenditure and mining has become more capital intensive during the 1980s, this can have caused the declining amount of taxes derived from the mining sector. Apart from the ones opened since the late 1980s, investments in new mines have been poor. This could be a reflection of the old tax regime's incapability to encourage investments.

Tax regimes are a critical and highly sensitive aspect of the investment environment. This particularly applies to mining where there might be long lead-times between exploration outlays, development expenditures, and returns on the original investments from post production profits. An equally important consideration is the desirability of maintaining a competitive tax regime compared to that of other mineral exporting countries, to ensure fiscal incentives are sufficient to attract high risk exploration and development funds from both foreign and local investors. In order to stem further falls in reinvestment figures and to encourage new explorations and improved diversification, a new mining code and a renewed taxation system were presented by the Namibian government in 1992.

### Summary and concluding remarks

Even though the mining sector in Namibia still dominates the country's economy, its role as a generator of economic growth has drastically lost importance. During the past decade, the contribution to GDP and export earnings of Namibia's main minerals has decreased. This reflects a combination of weak trading conditions in international commodity markets and the lack of internal and foreign investment brought on by uncertainties about the country's political and economic future, and moreover, tax policy has not sufficiently encouraged mining investments.

An analysis of the linkages between the mining sector and other sectors of the economy show that these have not been

**Table 10**  
**Direct taxes paid by Namibian mining companies 1980–1991**  
**(MZAR)**

Year	Profit	Total public revenue collected <sup>1</sup>	Taxes paid by mining companies <sup>2</sup>	Mining taxes as percentage of total	Taxes as percentage of mining share of GDP
1980	457.1	338	183 (54)	54.1 (16)	29
1981	253.6	292	151 (52)	51.8 (18)	33
1982	257.4	468	55 (53)	11.8 (11.3)	12
1983	241.9	439	48 (46)	10.9 (10.5)	10
1984	278.7	514	87 (50)	16.9 (9.7)	17
1985	650.7	626	133 (68)	21.2 (10.9)	15
1986	778.7	883	242 (89)	27.4 (10.1)	23
1987	477.9	1 103	317 (171)	28.7 (15.5)	42
1988	688.8	1 216	315 (156)	25.9 (12.8)	30
1989	667.5	1 480	322 (142)	21.8 (9.6)	26
1990	–	1 975	363 (206)	18.4 (10.4)	37
1991	–	1 649	198 (123)	12.0 (7.5)	18

Notes: 1. Excludes grants and borrowing. 2. Exclusive of the royalty payable to CDM. Figures in brackets are for diamond mining taxes.

Source: Commonwealth secretariat, London, 1993.

satisfactory. Neither backward nor forward linkages are specifically developed. The lack of skilled manpower in Namibia reduces spill over effects that should have generated growth in mining as well as in other sectors. During the 1980s employment figures in the mining sector as well as purchase power of the mine employees have deteriorated. As a result of the lower profits made by mining companies taxes derived from mining have declined. If the mining sector is to remain a cornerstone of Namibia's development, these weak linkages need to be improved.

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## Notes

ZAR = Rand, now Namibian dollars

<sup>1</sup> In 1990 eight foreign owned companies accounted for 98 per cent of the sector's production value (World Bank, 1992, p 3).

<sup>2</sup> De Beers controls 80 per cent of the world's diamond production of which only 20 per cent comes from its own mines in South Africa and Namibia (9 per cent). The rest is bought under contract with Angola, Botswana, Australia, the Commonwealth of Independent states, Zaire and Tanzania.

<sup>3</sup> Diamond's contribution to GDP has averaged about 13 per cent during the 1980s, the diamond industry employed 3 per cent of the total labour force in 1992 (*Economic review* 1992).

<sup>4</sup> Namibia's share of total world uranium production (excluding centrally planned economies) has increased from 9.1 per cent in 1980 to 10.6 per cent in 1989. In 1989 Canada was the largest producer (32.5 per cent), followed by USA (13.6 per cent) and Australia (11.2 per cent).

<sup>5</sup> Uranium is priced in Us dollars perpound. One pound equals 0,4536 kilograms.

<sup>6</sup> African share of total world production in 1991; copper 10 per cent, lead 5.2 per cent, and zinc 2.7 per cent (World Bureau of Metal, 1992).

<sup>7</sup> About 50 per cent of world demand is for electrical usage. The demand of copper is positively related to the price of energy. At low energy prices aluminium is used even though its intensity is lower than copper since it is relatively cheaper (Interview with Mr Moir, Managing Director, Onganja Copper Mine, March 20, 1993).

<sup>8</sup> The copper grade at the Tsumeb mine has decreased from 3,5 per cent in 1980 to 2,5 per cent in 1992 (*Tsumeb Corporation Limited Annual reports* 1980-1992).

<sup>9</sup> A myriad of problems in Peru, strikes and the closure of the Pin Point lead mine in Canada together with a number of mine closures in Europe had adversely affected the production.

<sup>10</sup> 60 per cent of all lead consumed are used in

the battery sector. In turn, the battery market is dominated by the automobile industry. In addition to vehicle production, the other major determinate of battery demand is vehicle population and weather conditions through their impact on the demand for replacement batteries.

<sup>11</sup> The lead grade at the Tsumeb mine has decreased from 6.5 per cent in 1980 to 1.5 per cent in 1992 (Tsumeb Corporation Limited Annual Reports 1980-1992).

<sup>12</sup> The galvanising sector is of great importance to the zinc market. There are two important end-use sectors for galvanised steel, construction and cars.

<sup>13</sup> There are several attempts to measure Hirshman's linkages. Pan Yotopoulos and Jeffrey Nugent use input-output tables. For a description of their formula see Gillis, 1987, p. 547-550.

<sup>14</sup> In 1992 it accounted for 60 per cent of all exported minerals from Namibia in terms of value (*Economic Review* 1992, p.30).

<sup>15</sup> Lead concentrates from TCL's own mines have drastically dropped from 39 500 tons in 1980 to 8 000 tons in 1991 (Tsumeb Corporation Limited, Annual Reports). Flows are currently augmented by old car batteries and dirty concentrates imported from the rest of the world.

<sup>16</sup> Total formal labour force was estimated at 184 600 in 1992 (The Economic Intelligence Unit 1991-1992, p.19).

<sup>17</sup> The Matchless mine was closed in 1983. However all miners were transferred to one of TCL's other mines, the Kombat mine. In November 1990 the Uis Tin mine closed down leaving about 1,500 people without a job. Uranium production has been cut back over the last years. In 1991 200 miners were retrenched from Rössing.

<sup>18</sup> By multiplying the real wage per labour in 1980 with the number of mining employees for the same year and compare these figures with the corresponding for 1991 we see that the purchase power of miners has deteriorated by 12 per cent.

<sup>19</sup> Since 1988 the number of employees in the formal sector has increased by 55 per cent (The World Bank, 1992, p 15).

<sup>20</sup> Capital expenditure is defined as expenditure on shaft sinking, mine equipment, general administration and management (Commonwealth Secretariat, 1993, p 186). ■